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FY-66

QUARTERLY REPORT

No. 4

31 May 1966

(1 March 1966 - 31 May 1966)

Prepared by:

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25X1

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25X1

Declass Review by NGA.

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SECTION I

INTRODUCTION

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31 May 66

SUMMARY

20X1 1. This Contract FY-66 Quarterly Report No. 4 is submitted in lieu of the May Monthly Report and covers PAR progress for the months March 1966, April 1966, and May 1966.

2. Detailed reports on approved, active PARs are found in Section II of this report.

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PROGRAM OBJECTIVE

To investigate, through studies, tests and the fabrication and use of engineering breadboard equipment, new methods or devices which will further the state-of-the-art in photographic techniques and practices as it pertains to improved extraction of collected intelligence information from photographic materials.

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DISCUSSION

3. PAR Status. The table below lists all PARs in numerical order for ready reference, and the title (condensed in some cases) and status of each.

<u>PAR</u>	<u>Title</u>	<u>Status</u>
201	Travel and Liaison	Active
202/ 224	Briefing Print Enlarger/ 3X - 15X Enlarger	Complete/TWX 6315 dtd 21 Jan 66
203	Rapid Access Printer	Completed 4 Aug 65
204	Contact Chip Printer	Termination Rpt completed 27 Jan 65
205	Precision 4X Enlarger	Termination Rpt completed 27 Jan 65
206	Reversal Processing Study	Completed 21 May 65
207	Contact Printer Study	Completed 6 Apr 66
208	Non-Elec. Image Enhancement	Cancelled
209	Phosphor Viewer	Cancelled
210	Laminated Slides	Completed 4 Sept 64
211	Processing Effects Study	Completed 28 Oct 65
212	Color Acq. System Review	Completed 28 Oct 65
213	Color Reprod. Review	Completed 13 Aug 65
214	Roller Transport Processor (12-Inch)	Closed/TWX 7284 dtd 23 May 66
215	Roller Transport Processor (24-Inch)	Closed/TWX 7284 dtd 23 May 66

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<u>PAR</u>	<u>Title</u>	<u>Status</u>
216	Laser Photographic Exposure	Completed 12 Beg 65
217	Optimization of Lasers	Completed 9 Nov 65
218	Autofocus Systems	Not to be submitted
219	Opt. vs Contact Ptg. 1:1	Not to be submitted
220	Static Elec. Hold-Down	Disapproved
221	Lens Bench Manual	Not to be submitted
222	Auto Stereo Regstrn System	Completed 3 Mar 65
223	Monochr. Lens System	Disapproved
225	Micro-D Training Program	Terminated
226	Edge Trace Meas., Micro-D	Completed
227	Color Viewer	Disapproved
228	Vectograph Study	Not to be submitted
229	Optical Design Film Viewer	Not to be submitted
230	10X Color Lens	Disapproved
231	10-20-40X Color Lamphouse	Disapproved
232	Automated Edge Trace Device	Disapproved
233	Zoom (6X to 60X) Projection Lens	Active
234	MTF Exposure Device	Disapproved
235	Automation Program Study	Disapproved
236	Film Disposal Rewind Unit	Disapproved
237	Briefing Aids	Completed 25 July 65
238	Equipment Installation	Closed/TWX 7284 dtd 23 May 66
239	Administration	Active
240	Not Assigned	-
241	Not Assigned	-

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<u>PAR</u>	<u>Title</u>	<u>Status</u>
242A	Color Demonstration Material	Completed 29 Mar 66
243	Briefing Print Enlarger	Active
244	Spare Parts for RT Processors	Awaiting customer action
245	BPE High Magnification Lens Sets	Awaiting customer action

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SECTION II
PAR PROGRESS

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PAR 207

31 May 66

SUBJECT: Definitive Study of Contact Printers

TASK/PROBLEM

1. Conduct a comprehensive evaluation of existing contact printers; i.e., flat bed, step and repeat, and drum platen (continuous types). Primary objective is to determine printers and/or techniques that will provide maximum fidelity of duplication.

DISCUSSION

2. The final report covering effort on the Phase I investigation of techniques and tools for evaluation of contact printers was forwarded to the customer on 6 Apr 66.

PLANNED ACTIVITY

3. None. Publication of the final report constitutes project completion.

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PAR 214

31 May 66

SUBJECT: Roller Transport Processor (12-Inch)

TASK/PROBLEM

1. Design and fabricate a versatile self-threading photographic processor capable of handling both cut sheet and continuous webs of photographic material and adaptable to a process yielding either standard negative or reversal images. Interchange between processes to be accomplished with a minimum of effort.

DISCUSSION

2. Polyethylene-surfaced rollers were installed in the processor during March 66 and checked out by the contractor. During the checkout, two rolls of 70mm film, Type 8430, were printed by the customer's production staff and processed on the RT-12R Processor. These rolls, one 500 feet long and the other 200 feet long, were run side by side through the processor, which was being operated in the reversal mode for this test. This run demonstrated that the RT-12R Processor is capable of producing a quality product, free of emulsion damage caused by the material used to construct the rollers.

3. A few random areas of emulsion damage were attributed either to dirt in the equipment, inadequate hardening, or both. Inadequate hardening may have been caused by the fixer used to conduct these tests. The recommended fixer for operation of the equipment in the reversal mode is Versamat Fixer, Type A.

4. The dichromate bleach racks have been rebuilt using epoxy-fiberglass side plates and steel drive gears. The ability of the racks to withstand the corrosive action of the dichromate bleach is now considered to be adequate. Contamination of dichromate bleach was found to be caused by leakage through a three-way valve which had been assembled incorrectly and set in the wrong position. This condition was corrected and the leakage eliminated.

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PAR 214

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5. Two air-activated, end-of-roll sensing switches located at the feed end of the processor were replaced by switches of more rugged design and construction.

6. By message 4132, dated 14 Apr 66, the contractor requested permission to close the subject PAR.

7. Customer message 7284, dated 23 May 66, authorized this PAR to be closed.

PLANNED ACTIVITY

8. None.

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PAR 215

31 May 66

SUBJECT: Roller Transport Processor (24-Inch)

TASK/PROBLEM

1. Design and fabricate a self-threading photographic processor capable of processing cut sheets up to 24 inches wide; machine to be darkroom operated.

DISCUSSION

2. Activity pertaining to equipment furnished on this PAR is reported under PAR 238.

3. Message 4133, dated 14 Apr 66, requested customer permission to close this PAR.

4. Customer message 7284, dated 23 May 66, authorized PAR 215 to be closed.

PLANNED ACTIVITY

5. None.

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PAR 233

31 May 66

SUBJECT: Zoom (6X to 60X) Projection Lens for Monochromatic Light

TASK/PROBLEM

1. Investigate the possibility of designing a 6X to 60X Zoom Projection Lens for Monochromatic Light.

DISCUSSION

2. Following a visit by the customer's representative on 28 Feb 66, our lens designers found that the use of a "light flint" glass in place of the "dense flint" considered previously could increase the system transmittance to the order of 50% at 3560A. The possibility of using this glass is provided by attempting correction of the system for a narrower spectral range (3600A to 3700A) than previously considered.

3. On 22 Mar 66, a contractor's representative visited the customer's facility to review this project, among others. It was pointed out in that conference that the UV-sensitive screen proposed for use with this lens is not an amplifying (image-intensifier) screen; hence, the energy radiated from the screen as an image is supplied entirely by the projected energy upon the screen. In this case, the large f -number (small aperture) of the proposed zoom system as observed from the screen may produce an image too dim for photo-interpretation use, even with transmittance at 50%.

4. The customer has directed the contractor to do no further work on this project until directed to do so.

PLANNED ACTIVITY

5. No further work will be done on this project until the customer so instructs.

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PAR 238

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SUBJECT: Equipment Installation

TASK/PROBLEM

1. Install and check out the following equipment at the customer's facility:

- a. Roller Transport Processor (12-Inch).
- b. Roller Transport Processor (24-Inch).

DISCUSSION

2. During March 66, successful processing of Kodabromide single-weight print paper was demonstrated on the RT 24-Inch Processor using a six-inch-long lead tab of Kodacel with a 5/8-inch to 3/4-inch-wide plastic screen interspaced across the full width of the print between the Kodacel and the paper print. Slits, 3/8-inch long and spaced 1-inch apart, were cut in the screen. Interlacing the print with the screen provided adequate protection for the leading edge of the print. The print was maintained in position in the interlacing by short lengths of tape placed in the center and at each edge of the splice.

3. A mechanical fixture was used to assist the assembly of lead tab to print at the head end of the processor. It has been demonstrated that one man with the aid of the mechanical fixture can assemble the print material to the lead tab and continuously operate the machine.

4. At an operating speed of 5.5 feet per minute, one was able to maintain a maximum spacing of one foot between assemblies of the lead tab and a 24-inch by 20-inch print as they were fed into the machine.

5. Prints, 24-inches wide by 30-inches long, were also successfully processed using the method described.

6. In messages 4132 and 4133, dated 14 Apr 66, the contractor requested permission to close PAR 238.

7. Customer message 7284, dated 23 May 66, authorized this PAR to be closed.

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PLANNED ACTIVITY

8. No further action.

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PAR 242A

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SUBJECT: Color Demonstration Material

TASK/PROBLEM

1. Provide samples of color material demonstrating the various color reproduction systems investigated under PAR 213, Color Reproduction Systems Review.

DISCUSSION

2. Three black-and-white transparencies and sixteen color transparencies were shipped to the customer on 29 Mar 66.

PLANNED ACTIVITY

3. None. Shipment of the material constitutes project completion. No final report is required.

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PAR 243

31 May 66

SUBJECT: Briefing Print Enlarger (Prototype)

TASK/PROBLEM

1. Design, fabricate and test a prototype briefing print enlarger (BPE) based upon tests and observations of the breadboard equipment developed on the combined PAR 202/224.

DISCUSSION

2. Breadboard enlarger tests, mechanical design studies, and the production of drawings for parts fabrication (detail drawings) have been made during this quarter.

3. Four of the six lenses planned for black-and-white printing have been tested for use on "Polycontrast" type print stock. The print image quality is essentially equal to that obtained on "Kodabromide" print stock. The remaining two lenses, which have not been tested with Polycontrast material, are quite similar in optical design to one of the four tested. It is safe to conclude that Polycontrast-type material can be used on the BPE to produce good-quality prints.

4. From the same series of tests on four of the six lenses, we are confident that the five lenses providing magnification from 3X to 39X can be used for exposing color prints. Additional color testing, including making color prints, is planned for these lenses.

5. Tests to measure the stable temperature reached in the negative gate with an extended exposure and a 500-watt source showed problems in the breadboard enlarger. The color filter and the plastic condenser element were damaged by heat. In the design of the prototype enlarger a second heat absorber element will be provided and air at a moderate velocity will cool the filters, condenser elements, and lamp. The light source for the prototype enlarger will be the same as that used on the breadboard enlarger; a 300 watt tungsten projection lamp.

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6. The basic design arrangement has been established and approximately 80% of the detail drawings made for the following:

- a. Negative transport.
- b. Print stock platen, carriage, and drive, including the focus table drum.
- c. Objective lens interchange mechanism.
- d. Objective lens focus mechanism and revised focus indicator.

7. Assembly drawings are yet to be made for these portions of the enlarger. However, the design and drafting effort is about 65% complete.

8. The design study portion of the lamphouse design effort is complete and about half of the detail drawings are made. Over-all design and drafting effort is about one-third complete on this unit. Additional manpower will be available soon to aid on completing this design.

9. Some design study effort has been made on all of the recognized remaining mechanical assemblies including:

- a. Coordinate counters.
- b. Fume venting system.
- c. Film drying (immersion fluid).
- d. Platen blower enclosure.
- e. Easel photometer.

10. The mechanical portion of the breadboard unit to test the planned arrangement of the easel photometer was completed and was being electrically connected to a EP-1000 photometer power chassis at the end of the quarter.

11. During the quarter, on 9 and 10 May, we were visited by customer's representatives. The revised proposal, PAR 243A, including a tentative specification, was presented and discussed. The design concepts of the various units mentioned above were described from the design study drawings. No changes in approach were requested.

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PLANNED ACTIVITY

12. Continue design studies and production of detail drawings, and make assembly drawings.

13. Test the breadboard model easel photometer and start design of the prototype unit, if the approach is satisfactory.

14. Fabrication releases for about 90% to 95% of all the parts in the prototype model will be made during the quarter. Some sub-assembly work may also be started during the quarter.

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